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ABSTRACT

By a wide margin, the major public health problem for teenagers in the United States is injuries associated with motor vehicle accidents. Starting at age 13, motor vehicle passenger death rates per capita climb sharply compared to passengers of other ages. Since deaths per licensed driver peak at the age of 13, insurance analysts have recommended raising the age of licensure to 18, allowing only essential (i.e., to and from work) driving by 16- and 17-year-olds, eliminating high school driver education courses, and prohibiting teenagers from driving during certain evening and early morning hours. Because teenagers have been found to be the least likely individuals to wear seat belts, it has also been recommended that the issuance of drivers licenses to teens be made conditional upon seat belt use and that the minimum drinking age be raised to 21. Finally, implementation of long-available crash-packaging techniques and clean-up and removal of highway and roadside hazards are measures that would markedly reduce traffic-related deaths of persons of all ages. (MN)

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insurance institute for highway safety

the highway loss reduction

Status Report

Vol. 16, No. 14 September 23, 1981

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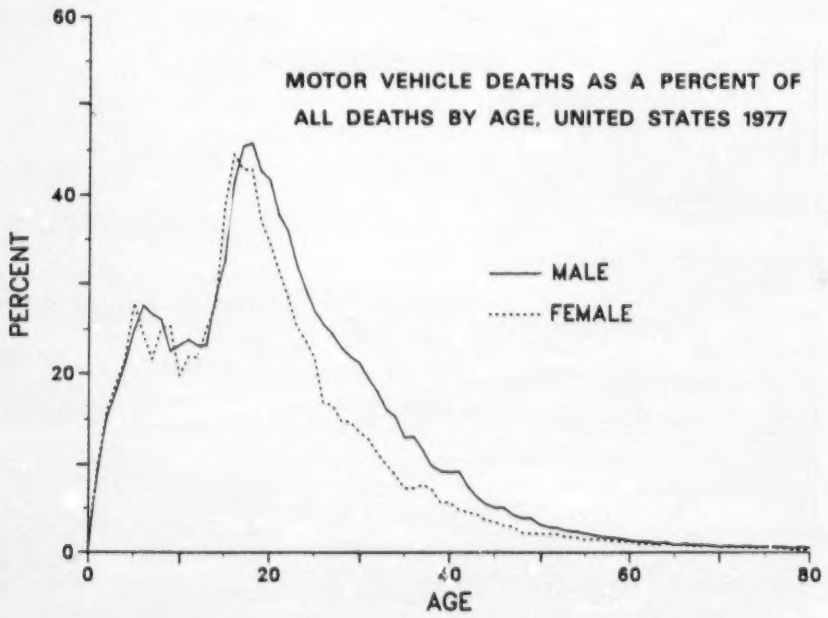
A Special Issue

Teens and Autos: A Deadly Combination

"By a wide margin, the major public health problem for teenagers in the United States is injuries associated with motor vehicle use."

The enormity of the issue is thus summed up in a new research study by the Insurance Institute for Highway Safety. Warnings of the sometimes-tragic combination of a teenaged driver and an automobile are common. But the real story goes beyond that. Starting at the age of 13, motor vehicle passenger death rates per capita climb sharply compared to passengers of other ages. Motor vehicle-related fatalities are suffered by teenagers at more than twice the rate that would be expected on a population basis. According to one Institute study, more than 7,000 teenagers lost their lives in passenger car crashes in 1978.

Deaths and injuries inflicted on any segment of the population in motor vehicle crashes constitute a costly burden in pain and suffering and in economic terms. When a disproportionate share of those costs can be identified as being caused by a particular group of drivers and passengers, it is especially important to examine public policies and countermeasures available. This special issue of *Status Report* focuses on some of the known facts and policy options relating to teenagers and automobiles.



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The Insurance Institute for Highway Safety is an independent, nonprofit, scientific and educational organization. It is dedicated to reducing the losses—deaths, injuries and property damage—resulting from crashes on the nation's highways. The Institute is supported by the American Insurance Highway Safety Association, the American Insurers Highway Safety Alliance, the National Association of Independent Insurers Safety Association and several individual insurance companies.

Some Facts About The Teen Years

Here are some highlights of Institute research findings about teenagers and motor vehicles:

• **THE DANGEROUS AGE** – Nearly half of all deaths of teenagers 16-19 years old are the result of motor vehicle crashes. Motor vehicles account for higher proportions of the deaths of 16,17, 18, and 19-year-olds than for any other age. This age group, which was 8 percent of the population in 1977, sustained 17 percent of all motor vehicle-related fatalities.

• **DRIVERS** – More deaths per licensed driver are associated with the crashes of 18-year-olds than with any other age. More than 60 percent of the passenger vehicle-related deaths of 16- and 17-year-olds, about one-third of the deaths of 15-year-olds, one-quarter of the deaths of 14-year-olds, and smaller but appreciable proportions of the deaths of persons of other ages from infancy through late adulthood resulted from 16- and 17-year-olds driving passenger vehicles.

• **PASSENGERS** – When teenagers drive they not only have a very high fatality rate themselves, but also contribute substantially to the deaths of others. Teenaged passengers show a high death rate per capita compared to passengers of other ages, the increases starting at 13. The majority of fatally injured teenaged passengers sustain those injuries in vehicles driven by teenagers.

• **SEX** – Teenaged males have much higher rates of driver involvement in fatal crashes than females. For males the rate peaks at 18, whereas for females it is highest at age 16.

• **NIGHTTIME** – More than half of the 16-19-year-old passengers and drivers who sustained fatal injuries did so in crashes taking place from 9 p.m. until 5:59 a.m. the following day.

• **ALCOHOL** – States that have raised their legal minimum drinking age have had a substantial reduction in nighttime fatal crashes.

• **SINGLE-VEHICLE CRASHES** – Fatal crashes of younger drivers were more likely to involve only the passenger vehicle they were driving than were crashes of older drivers.

• **DRIVER EDUCATION** – When high school driver education was eliminated from some school districts in Connecticut, there was a 57 percent net reduction in licensure of 16-17-year-olds from what would have been expected had driver education continued to be available, and a commensurate reduction in crashes in this age group.

• **RESTRAINTS** – Evidence from Ontario, Canada, indicates that even under a mandatory belt-use law, teenaged drivers – the age group most at risk – are least likely to use seat belts and are least affected by laws requiring their use.

Deaths Per Licensed Driver Peak At 18

The teen years are the most treacherous ones on the highway, and the age of 18 is particularly critical, a new study of teenaged drivers by the Insurance Institute for Highway Safety has shown.

More deaths per licensed driver were associated with the crashes of 18-year-olds than with any other age, reported Ronald S. Karpf and Allan F. Williams in an analysis of 1978 fatality data.

Next to the 18-year-olds, the 16-, 17-, and 19-year-olds had the highest rates of deaths per licensed driver; the figures then declined rapidly as drivers grew older. When depicted graphically, the statistics for almost every aspect of the teen driver problem jut up in towering peaks when compared to the pattern for the entire driver population. (See Figure 1.) Not only for teenaged drivers themselves, but also for passengers in their vehicles, for occupants of other vehicles into which they crash, and for nonoccupants such as pedestrians, the peak fatality figures are all associated with drivers in their teens.

Male, Female Rates Vary

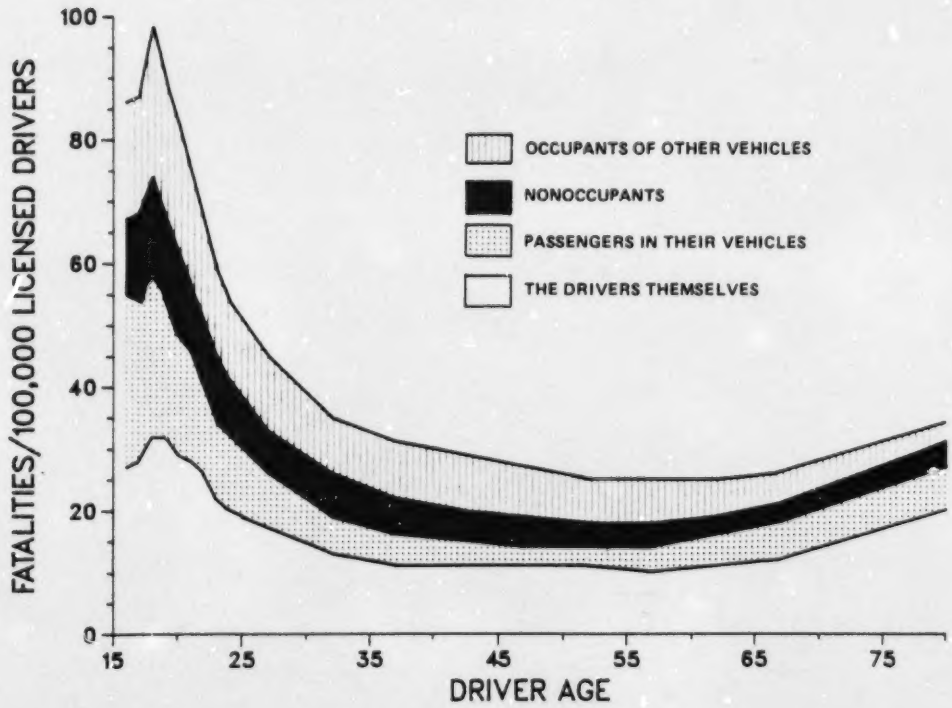
While 18 was the age of greatest involvement in fatal passenger vehicle crashes per licensed driver when both males and females were considered together, there was great variation between the sexes in the fatal crash data. For males the rate peaked at 18, while for females it was highest at 16. (See Figure 2.)

The death rates of drivers themselves were highest from 16 through 21, peaking at 18 and 19. Moreover, partly because young drivers appear to load large numbers of their friends into their cars, they were especially likely to have passengers in their vehicles die.

(Cont'd on page 4)

Figure 1

FATALITIES ASSOCIATED WITH CRASHES OF DRIVERS OF VARIOUS AGES, 1978



Deaths Per Licensed Driver Peak At 18 *(Cont'd from page 3)*

"Sixteen-year-old drivers had the highest rate of such passenger deaths," the researchers said, "in fact, fewer 16-year-old drivers were killed than were passengers in their vehicles."

Younger drivers were found more likely to be involved in fatal single-vehicle crashes than older drivers. Sixteen-year-old drivers had the highest proportion of such crashes at 39 percent. The rate remained near this level until after the age of 24.

Contribution Of 16- And 17-Year-Olds

In 1978 there were 4,198 deaths in crashes involving passenger vehicle drivers 16 and 17 years old. The young drivers themselves accounted for 1,344 of those deaths, and 1,307 of their passengers died. The other fatalities were occupants in other vehicles with which the teen drivers collided and nonoccupants (motorcyclists, pedalcyclists, and pedestrians). Taken together they all accounted for 10 percent of the 1978 deaths that occurred in crashes involving a passenger vehicle. These crashes involving 16- and 17-year-old drivers had a significant impact on the fatality toll for all of the teen years. They accounted for 60 percent of the passenger vehicle-related deaths of 16- and 17-year-olds, about one-third of the deaths of 15-year-olds, one-fourth of the deaths of 14-year-olds, and smaller but appreciable proportions of the deaths of persons of other ages from infancy through late adulthood. (See Figure 3.)

Considering the toll associated with teen drivers, the authors of the Institute study mentioned several possible measures that might reduce the loss of life in highway crashes. Among them were these:

• **Raise the minimum age of licensure to 18.** "This would undoubtedly be an effective policy, although not all of the more than 4,000 fatalities that result annually from the driving of 16- and 17-year-olds would be eliminated. Some might drive without licenses; those not allowed to drive would become potential pas-

Figure 2

NUMBERS OF DRIVERS OF PASSENGER VEHICLES IN FATAL CRASHES PER 100,000 LICENSED DRIVERS, UNITED STATES 1978

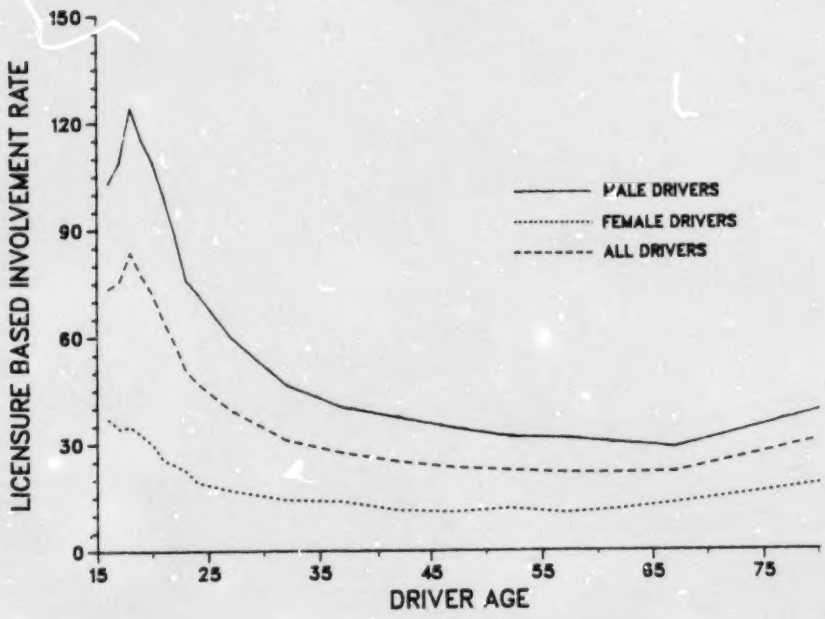
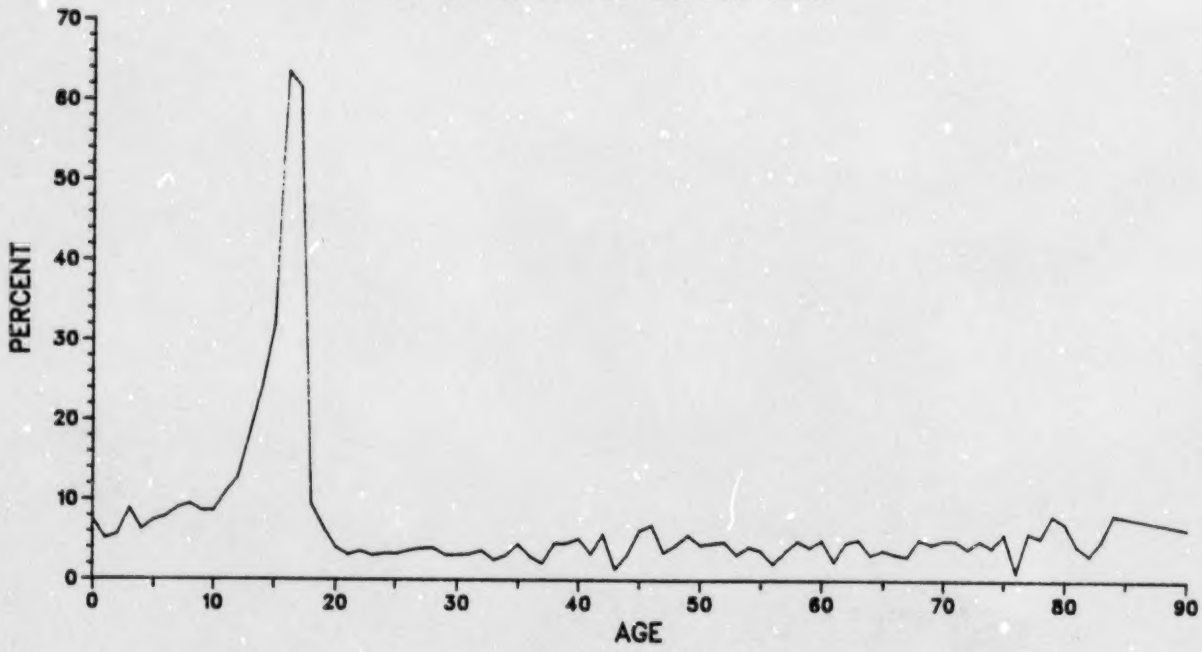


Figure 3

PERCENTAGE OF PASSENGER VEHICLE RELATED DEATHS IN VARIOUS AGE GROUPS INVOLVING 16–17 YEAR OLD DRIVERS, UNITED STATES 1978



sengers; and to some extent older drivers would substitute for 16- and 17-year-olds in providing transportation."

• **Allow only "essential" driving by 16- and 17-year-olds, e.g., to and from work.** This is seen as one way of offsetting the inconvenience or hardship for many teenagers and their parents in raising the age of licensure.

• **Eliminate high school driver education.** "High school driver education has been found to increase substantially the numbers of 16-17-year-olds licensed, without reducing crashes." (See report on page 10.)

• **Prohibit teenagers from driving during some late evening/early morning hours.** "Almost half the fatal crashes of drivers less than 18 years old take place from 8:01 p.m. to 4 a.m."

• **Implement long-available crash-packaging technologies and clean up highway and roadside hazards.** "Deaths of motor vehicle occupants of *all* ages could be markedly reduced" by such measures, including making air bags available for public use.

• **Make licenses for teen drivers conditional on seat belt use.** This measure should be considered for 16- and 17-year-olds and possibly older teenagers, who rarely use seat belts.

Copies of the report, "Teenage Drivers and Motor Vehicle Deaths," by Ronald S. Karpf and Allan F. Williams, are available from the Insurance Institute for Highway Safety, Watergate 600, Washington, D.C. 20037.

Teen Passenger Toll Is Heavy, Starting at 13

Teenaged drivers not only are more in jeopardy than drivers of other age groups but – less well known – they also contribute substantially to the deaths of other teenagers as passengers.

A new research study by Allan F. Williams and Ronald S. Karpf of the Insurance Institute for Highway Safety focuses on the deaths of teenaged passengers and includes these findings:

- Teenaged passengers show a high death rate per capita compared to passengers of other ages, the increased rates starting at 13.

- The majority of fatally injured teenaged passengers sustain those injuries in vehicles driven by teenagers.

- Deaths of teenaged passengers tend to occur in nighttime crashes, especially weekend nighttime crashes.

Deaths of teenagers as passengers and as drivers are actually about equal, the researchers reported. From 1978 data, they found that 63 percent of all teenaged passengers who are killed sustained their injuries in vehicles driven by teens. They also discovered that 72 percent of all passengers fatally injured in vehicles driven by teenaged drivers were teenagers.

Death Rates Rise At 13

Teenaged passengers account for nearly one in three of all passenger deaths in passenger vehicles, the new study reports. Passenger death rates per capita begin to rise at 13, the researchers reported, exceed driver death rates until 17, and are higher at each age from 16 to 19 than at any other time of life.

Figure 1

FATALLY INJURED OCCUPANTS OF PASSENGER VEHICLES
PER 100,000 UNITED STATES POPULATION, 1978

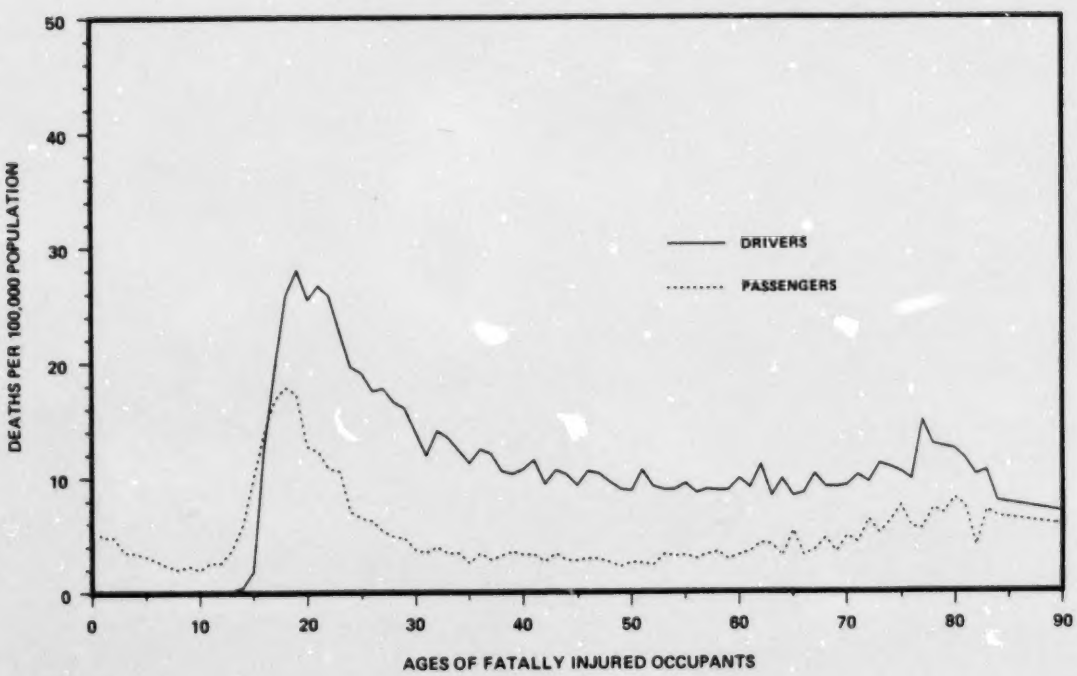
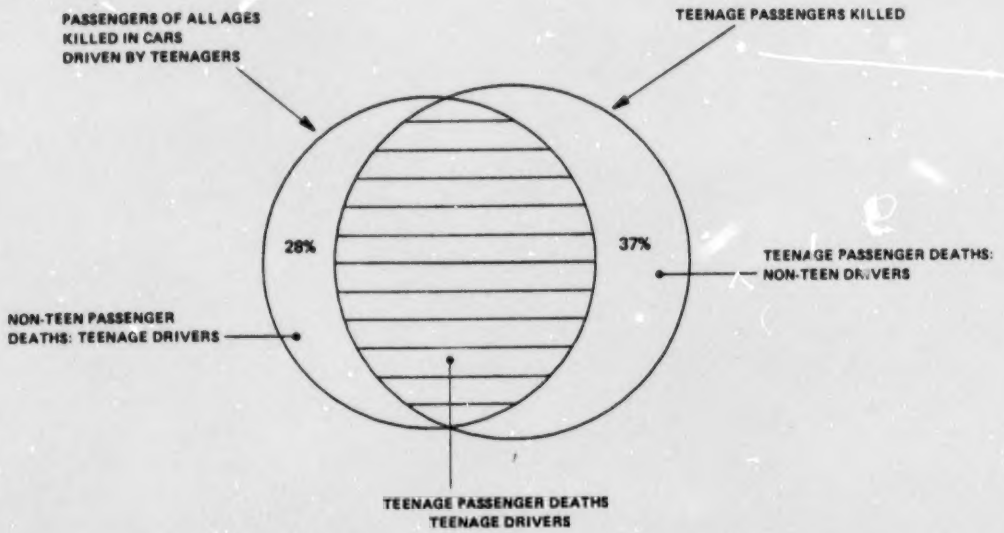


Figure 2

CONTRIBUTION OF TEENAGE DRIVERS TO DEATHS OF TEENAGE PASSENGERS



Among all teenagers, male drivers had the highest death rate per capita, followed by male passengers, female passengers, and female drivers, in that order. From 13 through 16 the rates for both male and female passenger deaths increased in a similar fashion, diverging after 16. The male rates rose sharply and peaked at 19 before declining sharply; female rates were about the same for 16 through 18, then declined.

In the 1978 data, 67 percent of the deaths of teenaged male passengers and 58 percent of the deaths of teenaged female passengers resulted from travel with a teenaged driver. "Teenaged drivers are a major source of transportation for teenage passengers," the researchers commented, "and there is some evidence that the presence of teenage passengers, especially in large numbers, is associated with increased crash risk for teenage drivers." Because of this the authors recommended that consideration be given means to prohibit teenaged drivers from transporting teenaged passengers.

Many Die In Nighttime Crashes

More than half of both the passengers and drivers in the 16-to-19 age range who were reported fatally injured in the 1978 data sustained their injuries in nighttime crashes. The researchers found that males in this age range were more likely than females to die in nighttime crashes.

The study referred to suggested ways to reduce the deaths of teenaged drivers offered in another study (see report on page 3), and said the same measures would be effective in reducing the deaths of teenaged passengers. Pointing especially to the need for seat belt use, the researchers noted that a number of states in recent months have passed requirements for child restraint use.

"Child restraint laws are important, but the need is much greater for teenagers," the authors said. ' In 1978 there were 592 children 0-3 years old fatally injured in passenger vehicles in the United States, compared to 6,291 fatalities among 16-19-year-olds."

Copies of the study, "Deaths of Teenagers as Passengers in Motor Vehicles" by Allan F. Williams and Ronald S. Karpf, are available from the Insurance Institute for Highway Safety, Watergate 600, Washington, D.C. 20037.

Curfew, Licensing Delay Seen As Options

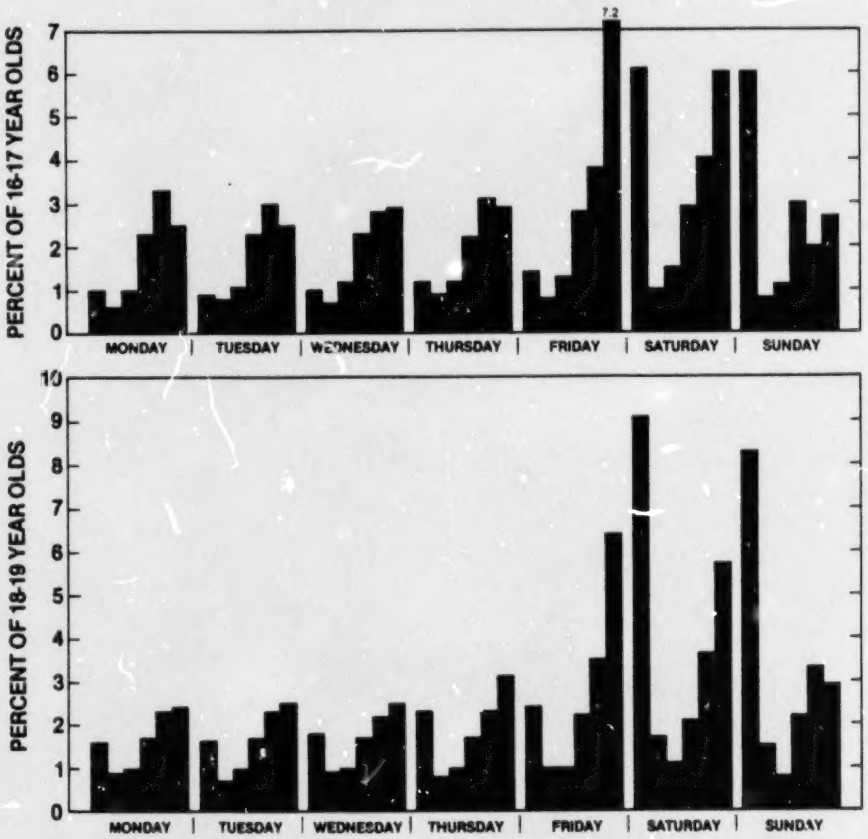
Postponing driver licensure until 18 and restricting the hours that young drivers are permitted to drive are two of the most promising measures that might reduce teenaged drivers' involvement in fatal crashes, a Yale University researcher has suggested.

Leon S. Robertson of the university's Center for Health Studies came to these conclusions in a study of teenaged drivers and their fatal crash involvement. The study, published in the Summer 1981 issue of the Journal of Health Politics, Policy and Law, was supported by the Insurance Institute for Highway Safety.

Robertson examined data on fatal crashes from 1975 through 1978 involving 236,205 drivers, including 19,470 under 18 years of age. From the patterns he found he concluded that an "increase in teenager deaths in the 1960s and early 1970s resulted at least partly from public policy specifically intended to reduce the crash involvement of teenaged drivers." Among the programs with questionable results he mentioned were alcohol and drug education programs that have proliferated in schools and may have contributed to increased use of narcotics and resulting problems on the highways, and high school driver education. (See report on page 10.)

"Clearly, greater consideration should be given to the potential effects of public policies before they are widely adopted," the researcher said.

Fatal Crash Involvement of Driver Age Groups by Time of Day and Day of Week*



*Each day is divided into six four-hour increments

The study pointed out that almost half of the fatal crashes involving drivers under the age of 18 occur in the four hours before or the four hours after midnight. "Thus, modification of the licensure laws to allow those less than 18 years old to operate vehicles only from 4 a.m. to 8 p.m. has the potential to reduce their fatal crash involvement if such a provision could be effectively enforced," Robertson said. He noted that police enforcement would be difficult but that parents aware of such a law might reduce the availability of vehicles to 16- and 17-year-olds late at night.

There were no adult passengers in 83 percent of vehicles in fatal crashes involving drivers below the age of 18, Robertson noted. Requiring the presence of an adult in the car for drivers of that age might reduce their involvement in fatal crashes, he said. However, he warned that such a measure should be carefully researched before adoption because of the possibility that more adult deaths would result.

Copies of the study, "Patterns of Teenaged Driver Involvement in Fatal Motor Vehicle Crashes: Implications for Policy Options," by Leon S. Robertson may be obtained from the Insurance Institute for Highway Safety, Watergate 600, Washington, D.C. 20037.

Raising Drinking Age Reduces Fatal Crashes

States that have raised their legal minimum drinking age in recent years have had a substantial reduction in nighttime fatal crashes, Insurance Institute for Highway Safety researchers have reported.

In the early 1970's more than half of all the states lowered their minimum drinking ages. But between 1976 and January of this year, 14 states had reversed that trend and raised the minimum ages. The Institute research indicated that about 380 fewer young drivers are involved in nighttime fatal crashes each year in these 14 states since the minimum ages were raised.

28 Percent Reduction Is Average

"Any single state that raises its drinking age can expect the involvement in nighttime fatal crashes of the age groups to which the change in the law applies to drop by about 28 percent," the researchers reported. In eight of nine states studied, reductions were found ranging from 6 percent to 75 percent. In only one state, Montana, was no net reduction observed.

Included in the study were Illinois, Iowa, Maine, Massachusetts, Michigan, Minnesota, Montana, New Hampshire, and Tennessee. The research project excluded five other states that had raised their minimum drinking age so recently that there had not been sufficient time for the results to be measured with available data.

While alcohol is known to be a major factor in all fatal crashes, it is particularly involved in nighttime fatal crashes. Other research (see report on page 8) has reported that almost half of all fatal crashes involving drivers under 18 happen between 8:01 p.m. and 4 a.m.

More Gains Seen Possible

While a significant number of lives were saved by the law changes, the researchers predicted that even more substantial gains might be made if all 31 states (including seven of the nine studied) that as of last January had a drinking age of less than 21 were to raise the minimum to 21. Such action would mean that each year about 730 fewer young drivers would be involved in nighttime fatal crashes, the study estimated.

(Cont'd on page 10)

Raising Drinking Age Reduces Fatal Crashes *(Cont'd from page 9)*

"Raising the legal minimum drinking age to 21 in all states would have an important impact in reducing the annual toll of motor vehicle deaths in the United States, particularly the deaths of young people and of others with whom they are involved in crashes," the researchers said.

Copies of the study, "The Effect of Raising the Legal Minimum Drinking Age on Fatal Crash Involvement" by Allan F. Williams, Paul L. Zador, Sandra S. Harris, and Ronald S. Karpf, are available from the Insurance Institute for Highway Safety, Watergate 600, Washington, D.C. 20037.

High School Driver Ed Promoting Early Licensure

A Connecticut study has underscored the role of high school driver education in promoting the licensure of 16- and 17-year-olds and, as a result, their increased involvement as drivers in crashes.

In 1976, Connecticut dropped state funding for high school driver education, and eight municipalities and one regional school district eliminated the courses from their high school curricula. This provided an opportunity to observe the effects on licensure and crash involvement in the affected school districts, contrasted with nearby communities that retained their programs.

A 1980 study, carried out at Yale University's Center for Health Studies, indicated that elimination of high school driver education in these communities led to a 57 percent reduction in licensure among 16- and 17-year-olds during a three-year period, compared to a 9 percent decrease in communities that retained the program.

Conducted by Leon Robertson under a grant from the Insurance Institute for Highway Safety, the study also showed the communities without high school driver education experienced a 63 percent reduction in the crash rate among 16- and 17-year-olds on a population basis, compared with little change in the crash rate in communities that retained the programs. (See *Status Report*, Vol. 15, No. 9, June 10, 1980.)

The study noted earlier research in England and the U.S. which found that "more driver education was related to more licensed drivers," with the net result being higher crash involvement per capita for 16- and 17-year-olds. (See *Status Report*, Vol. 12, No. 17, Nov. 30, 1977.)

"About 75 percent of the 16-17-year-olds who could be expected to have been licensed if they had taken high school driver education waited until they were 18 or older to be licensed when high school training was no longer available," the Robertson study concluded.

"The intertwined and more far-reaching issue is whether or not 16-17-year-olds should be licensed to drive whatever their training. Many state laws do not allow persons less than 18 years of age to vote, sign contracts, play pinball machines, and the like. And yet persons apparently considered insufficiently mature for such activities are licensed to assume responsibility for operating vehicles that so commonly kill and maim."

Robertson noted that in Connecticut – which has a relatively low crash rate – about one in five drivers licensed at 16 will be involved in a crash causing injury or more than $400 in property damage before their 18th birthdays.

Teens Found Least Likely To Obey Belt-Use Law

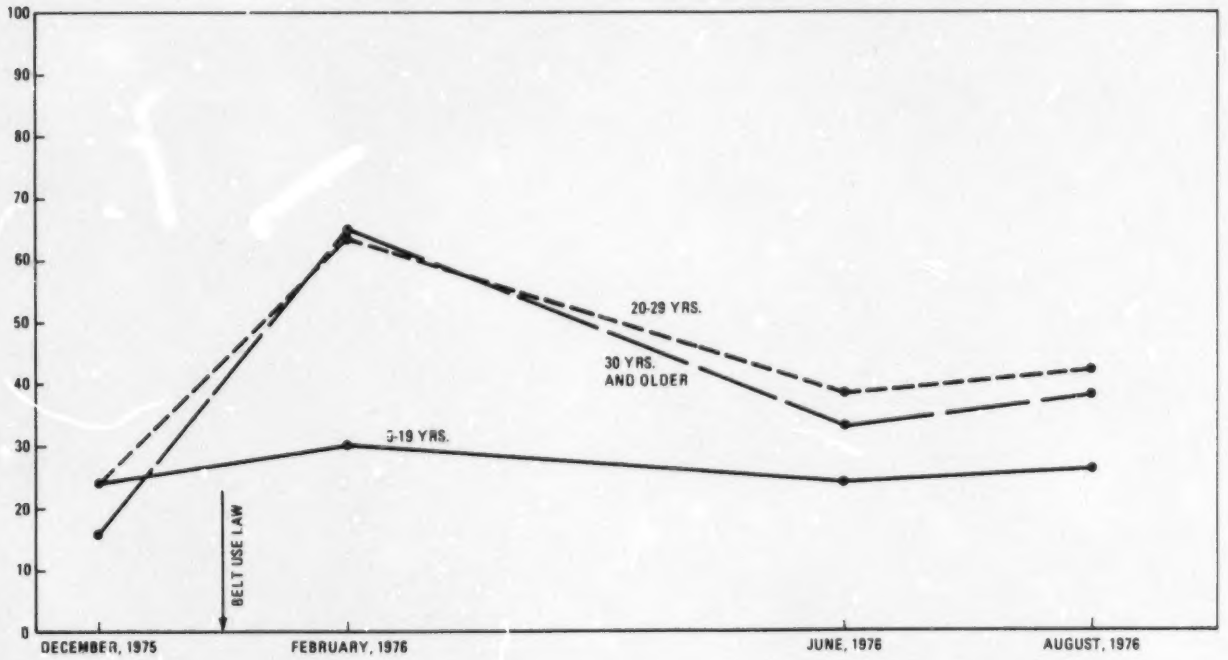
A belt-use law in Ontario, Canada, succeeded in raising the belt-use rates of the general population, but researchers found those most at risk – teenaged drivers – were least likely to obey it.

In November 1975, the province of Ontario adopted a law requiring vehicle drivers and passengers to wear seat belts. Researchers for the Insurance Institute for Highway Safety conducted surveys of belt-use patterns both before and after enactment of the law.

In December 1975, a month before the law became effective, 21 percent of the drivers surveyed at urban and rural sites were seen wearing belts. In February 1976, after the law went into effect, belt use by drivers jumped to 71 percent. But by August that year, it had fallen to 48 percent overall.

The story was different for teenaged drivers and passengers in their teens and under. "Shoulder belt use by teenaged drivers and teenaged or younger passengers was apparently only slightly and temporarily affected by the law," wrote researcher Leon Robertson. About three-fourths of persons estimated to be 5-19 years of age were *not* using shoulder belts in December, before the law, and in June and August of the following year. This was after a very slight increase in February, right after the law went into effect. (See graph.)

PERCENT DRIVER AND RIGHT FRONT PASSENGER SHOULDER BELT USE IN EQUIPPED CARS BEFORE AND AFTER A MANDATORY BELT USE LAW WENT IN FORCE JANUARY 1, 1976 IN ONTARIO, CANADA, BY ESTIMATED AGE.



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